



Department of Commerce

Safety & Buildings Division

201 West Washington Avenue

P.O. Box 2658

Madison, WI 53707

Approval #

970034-U (Rev. 2)

## Wisconsin Material Approval

Material

ConVault Insulated Vaulted aboveground Tanks

Manufacturer

ConVault, Inc. and Licensed Manufacturers

4109 Zeering Road

Denair, CA 95316

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### SCOPE OF EVALUATION

The ConVault insulated, vaulted aboveground storage tank for flammable liquids was evaluated for conformance with the design, construction and listing requirements of **ss. Comm 10.355, 10.455, 10.415 (2)** of the current edition of the Wisconsin Administrative Flammable And Combustible Liquids Code.

### DESCRIPTION AND USE

The ConVault insulated, vaulted tank is an assembly of a steel tank with secondary containment and 6-inch concrete encasement. The primary steel tank has a minimum plate thickness of 0.135 inches. The tank has openings on the top only consisting of threaded pipe fittings and optional manways. The tank has openings for a 2-inch standard vent and 6-inch emergency vent. The steel tank is insulated with 1/4 inch of polystyrene which also serves to form the interstitial space between the steel tank and membrane containment barrier. The secondary containment membrane is constructed of high density polyethylene and envelops the insulated tank. A steel leak detector tube is installed between the containment

membrane and steel tank to provide access for monitoring the interstitial space. The concrete encasement is a minimum 6-inch thickness of standard weight (approximately 150 lb./cu. ft.) Portland cement concrete with a minimum 28-day compressive strength of 3,000 psi and with 3 percent air entrainment to provide a two-hour fire-resistive rating. As an alternative, lightweight concrete (approximately 110 lb./cu. ft.) may be used to provide a higher four-hour fire-resistive rating. The concrete is reinforced with steel mesh or steel reinforcing bars and fibermesh dispersed throughout. The concrete encasement includes a 4-inch or 6-inch integral footing to support the tanks above its base slab and allow for full visual inspection. The tank exterior is coated with a white epoxy sealant, or acrylic finish, or exposed aggregate finish.

The steel tank is supported in the form by special supports attached to the top of the tank only. This allows the concrete to be placed on the bottom and sides of the tank without steel supports penetrating the concrete encasement.

Single product ConVault insulated, vaulted tanks are manufactured in the following nominal sizes: 250 , 500 , 1000 , 2000 , 4000 , 5200 , 6000 , 8000 , 10,000 , and 12,000 gallons. Dual product tanks are manufactured in the same nominal sizes (aggregate capacity); the individual sections of dual product tanks range from 125 gallons to 12,000 gallons, nominal.

The insulated, vaulted tank includes the following items:

- a) UL listed tank with 7 gallon internal spill/over-fill container.
- b) Safety decals on all four sides 6-inch red letters on white background.
  - “Flammable or Combustible”
  - “No Smoking”
  - Product in Tank
- c) Fill pipe (4-inch with drop tube terminating within 6-inches of tank bottom.
- d) Lockable fill cap.
- e) Emergency vent (6-inch) relieving at 8 oz. pressure.
- f) Vent pipe (2-inch), 8 feet long to ensure 12 feet height aboveground.
- g) Vent cap (2-inch)
- h) Direct reading level gauge.
- i) Leak monitor in leak detector tube.

Where required for Phase I vapor recovery, the fill pipe drop tube is coaxial and 2-inch vent is a pressure/vacuum type.

Tanks designed for waste oil storage are also provided with a waste oil receptacle.

Tanks used for vehicle fueling are also provided with a vent whistle or an audible high level alarm as required by **s. Comm 10.415 (12) (b)**.

### TESTS AND RESULTS

The Convault Tanks have been tested and listed by U.L. in accordance with U.L. Standard 2085.

- a) Insulated Aboveground Tank for Insulated Aboveground Tank for Flammable Liquids,
- b) Insulated Aboveground Tank for Flammable Liquids, Protected Type: "CVT(a)", Vehicle Impact Resistant, Projectile Resistant,
- c) Insulated Secondary Containment Aboveground Tanks for Insulated Aboveground Tank for Flammable Liquids, and
- d) Insulated Secondary Containment Aboveground Tanks for Insulated Aboveground Tank for Flammable Liquids, Protected Type: "CVT(a)", Vehicle Impact Resistant, Projectile Resistant.

The Convault Tanks have been UL tested and listed as Venting by Form of Construction.

Structural calculations for vehicle collision barriers are on file with the department.

### LIMITATIONS OF APPROVAL

ConVault tanks are approved for compliance with the design, construction and listing requirements of **ss. Comm 10.355, 10.455, and 10.415 (2)** for storage, waste oil, vehicle fueling, farm tanks and fuel oil tanks. The tanks shall display the UL label specifying above-ground flammable and combustible liquid use.

ConVault tanks are approved for compliance with the secondary containment requirements of **ss. Comm 10.345 (1) and 10.415 (7)(b)** and may be used without a dike, except in the case of public-access waste oil collection. Tanks for public-access waste oil collection shall be provided with a dike in accordance with **s. Comm 10.33**.

ConVault tanks up to 10,000 gallons capacity are approved for use as part of an aboveground vehicle fueling system in accordance with **s. Comm 10.415**.

The interstitial space shall be monitored for leaks. The monitor must be capable of detecting a leak from anywhere in the inner tank.

Compartmentalized tanks shall be constructed for a double bulkhead in accordance with UL Standard 142. This interstitial space between compartments shall be monitored for leaks.

A spill container shall be provided at the fill opening in accordance with **s. Comm 10.415 (12)(a)**.

Vehicle collision protection is not required for the tanks, themselves. Where fuel dispensing equipment is mounted on the side of the tank or at grade adjacent to the tank, this dispensing equipment shall be protected by either of the following methods: 1) Four inch schedule 40 steel pipe, minimum 72-inches long, embedded 36-inches deep in a 15-inch diameter concrete footing, and spaced a maximum four feet on center; or 2) 3,000 psi reinforced concrete barriers 2-feet long, 24-inches wide at the base and 24-inches tall, anchored at the four corners with 3/4-inch concrete or soil anchors, with a maximum spacing of six feet on center. Both types of barriers shall be placed to provide 24-inches of clearance between the barrier and the outside of the fuel dispensing equipment.

Where the pump is mounted directly to the tank top, an electrically-operated solenoid valve normally required by **s. Comm 10.415 (10) (c)** may be omitted if the following design is used: the pump is mounted directly to the tank top opening with a single riser and there is no other piping; the pump is a single unit with all metering and registration on the top of the tank; and the dispensing hose exits directly from the pump and a vacuum breaker suitable for that use is provided at the discharge of the pump.

No attachments shall be made to the tank which violate or void the UL Listing.

The tank shall be installed to allow full visual inspection of the secondary containment system.

The ConVault is approved as providing a 4-hour or 2-hour rated fire-resistive enclosure. The standard weight Portland cement concrete vault (approximately 150 lb./cu. ft.) provides a 2-hour, fire-resistive enclosure. The lightweight concrete vault (approximately 110 lb./cu. ft.) provides a four-hour fire-resistive enclosure. The applicable setback reductions are specified in **s. Comm 10.415 (4)**. The fire-resistive rating of each vault shall be provided on a permanent label affixed to the vault.

The vaulted tank is approved as providing equivalent protection to the fencing requirement of **s. Comm 10.415 (5) (a)** for the tank itself. In order to provide equivalent protection for the pump and appurtenances, the site shall be provided with dusk-to-dawn lighting and any stairs or ladders attached to the vault shall be secured against unauthorized use.

The installer shall be certified by the department in accordance with **ch. Comm 5**.

This approval will be valid through December 31, 2002, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Material Approval Number must be provided when plans that include this product are submitted for review.

DISCLAIMER

The Department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement unless specified herein.

Reviewed by: \_\_\_\_\_

Approval Date: \_\_\_\_\_

Revision 1 Date: \_\_\_\_\_

Revision 2 Date: \_\_\_\_\_ By: \_\_\_\_\_

Duane Hubeler, P.E.  
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